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**A COMBINED TOTALIZATOR
AND FIXED ODDS BETTING SYSTEM AND METHOD**

ABSTRACT

5

The present invention discloses a combined totalizator and fixed odds betting system able to be operated both on and off-course via a central computer (C) connected with communication links (L) to a large number of betting terminals (T). Both totalizator wagering and fixed odds betting are conducted with a common pool. During
10 the betting a succession of periods of time are opened and closed and in each of which a plurality of fixed odds bets are accepted and during each of which the odds offered for each contestant or runner remain fixed.

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COMPLETE SPECIFICATION

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ORIGINAL

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Invention Title:

A Combined Totalizator and Fixed Odds Betting System
and Method

The following statement is a full description of this invention, including the
best method of performing it known to me/us:-

A COMBINED TOTALIZATOR AND FIXED ODDS BETTING SYSTEM AND METHOD

5 The present invention relates to win totalizators and, in particular, to a combined win totalizator and fixed odds betting system implemented on a distributed computing system.

10 The concept of the totalizator was developed in the early years of the twentieth century as a means of ensuring consistent earnings to a government or race club which operates a legalized betting system. In recent years the totalizator systems have become very substantial business concerns with many "betting shops" each having one or more computer terminals which are connected to a central processor or central computer. Where the totalizator is operated at a single racecourse, the central processor can be the central processor unit of a relatively small computer having only a relatively small number of terminals at which only racegoers to that particular meeting place their bets. 15 Alternatively, the totalizator can operate over a single jurisdiction such as a state, in which case there can be over a thousand betting shops and many thousands of terminals.

20 The basic principle of a totalizator is to pool the monies wagered by all punters, deduct a commission from this pool, and pay a dividend to those winners which is calculated from the balance of the pool divided by the number of winning units. In this connection a winner is paid in accordance with the number of units (usually \$1) which the winner has purchased in the totalizator or tote. Because the commission is taken from the pool prior to dividing the pool amongst the winners, the tote operator is guaranteed a return which is directly linked to the volume of money, or turnover, wagered on each race. In recent years licensed gaming authorities have also 25 accepted wagers on sporting fixtures in addition to racehorses, greyhounds, etc.

30 The totalizator system has been outstandingly successful in reducing the incidence of illegal betting, particularly by unlicensed off-course bookmakers. In addition, the revenue generated by the commission withdrawn from the pool of money wagered on each race or other sporting event, has also been able to be used to improve the standard of racing and other sporting facilities.

35 Because of the large number of betting shops distributed over, say, a state, it is not uncommon for a major race in the state of New South Wales that the total totalizator win pool to be of the order of \$500,000, of which only of the order of \$50,000 has actually been wagered on course at the totalizator facilities at the racecourse. Because of the computerisation of the totalizator, it is possible for a totalizator to remain open not only up to advertised race start time (ARST) but also beyond this time until the racers (be they horses, trotters, greyhounds, human runners, etc) actually start. It is well known that the volume of money invested into the

totalizator pool grows with time and can increase substantially in the last minutes before a race. Thus a typical

Saturday afternoon race, for example, will see the totalizator open on the Friday and small amounts of money will be invested on that day and early on the Saturday morning. However, during the afternoon increasing amounts of money are wagered in an increasing crescendo which culminates with the closing of the totalizator. One of the reasons for this is that the totalizator is used by on-course bookmakers to lay off large bets they may have taken on particular runners in a race and/or to better balance their risk on a particular race. In addition, arbitrage punters will place bets both with on-course bookmakers and the totalizator if the likely returns on the two systems available are perceived to be potentially rewarding. A large percentage of off-course punters also wait until late approximate win dividend updates are available before placing their wagers.

During the course of the totalizator being open, the likely return (or dividend) to be paid in the event of a particular runner winning the race, is displayed for each runner. As the favourable sentiment of various runners waxes and wanes, and relatively more or relatively less money is backed on particular runners, so the approximate or likely dividend for the various runners changes. This changing forecast tote dividend is displayed in the lead up to the race and is information which is eagerly sought after by punters.

Despite its many advantages, the totalizator system suffers from several disadvantages. One such disadvantage is that professional punters are, in practical terms, obliged to limit the volume of their wagers since a very large bet would effectively "swamp" the return for the particular horse. This would very substantially reduce the pay out, even if the punter were certain of the outcome. Furthermore, many persons prefer as either a cultural or habitual idiosyncrasy to place bets at fixed odds. This is the traditional betting system offered by bookmakers and has the advantage for the punter that the return, in the event of a win, is fixed.

In addition, many punters wish to derive enjoyment from being able to place a bet on a horse at high odds and have the satisfaction of seeing the odds for their selection reduce in the lead up to the race because of "the pressure of money". The satisfaction gained is that of knowing that their acumen was "ahead of the pack". For these reasons and other reasons illegal starting price off-course bookmakers who operate by telephone have not been completely eliminated, notwithstanding the overall commercial and social success of totalizator systems.

It is the object of the present invention to substantially overcome or ameliorate the above mentioned disadvantages by the provision of a fixed odds betting system for punting on the outcome of a race, which system can be expected to be operated by a

totalizator agency board, or like legalised entity, so as to return a modest, but consistent, profit to the operating authority.

In accordance with a first aspect of the present invention there is disclosed a method of operating a combined win totalizer and fixed odds betting system for punting on the outcome of a contest between a plurality of contestants, said method comprising the steps of:

1. operating a tote wager pool comprising a substantially conventional totalizer,
2. operating a bet dividend pool accepting fixed odds bets on each contestant,
3. sequentially opening and closing a succession of periods of time in each of which a plurality of fixed odds bets are accepted and during each of which the odds offered for each contestant remain fixed, and
4. prior to the opening of each said period of time utilising the liabilities for each contestant arising both from wagers to date placed into the tote wager pool and bets to date made into said bet dividend pool to calculate the fixed odds to be offered for each contestant during the immediately following period of time.

In accordance with another aspect of the present invention there is disclosed a combined win totalizer and fixed odds betting system for punting on the outcome of a contest between a plurality of contestants, said system comprising:

1. a plurality of betting terminals each linked to a central processor means and each able to input either a tote wager or a fixed odds bet;
2. a tote wager pool into which said tote wagers are allocated and comprising a substantially conventional totalizer, and
3. a bet dividend pool into which said fixed odds bets on each contestant are allocated, wherein

said central processor means is arranged to sequentially open and close a succession of periods of time in each of which a plurality of fixed odds bets are accepted and during each of which the odds offered for each contestant remain fixed, and

said central processor means prior to the opening of each said period of time, utilises the liabilities for each contestant arising both from wagers to date placed into the tote wager pool and bets to date made into said bet dividend pool to calculate the fixed odds to be offered for each contestant during the immediately following period of time.

A preferred embodiment of the present invention will now be described with reference to the drawing and to the Tables appearing at the rear of the specification in which:

Fig. 1 is a schematic diagram illustrating the computer system operated by the applicant, TAB Limited,

Table I illustrates the calculation of the tote win pool based on the initial investment,

5 Table II illustrates the calculation of the fixed odds betting (FOB) dividend based on the initial tote investment,

Table III illustrates the calculation of the updated combined pool,

Table IV illustrates the calculation of the revised or updated FOB dividend,

10 Table V shows the calculation of the revised FOB dividend for Runner 7 in Table IV,

Table VI shows a calculation to determine a maximum available bet on Runner 7 utilising data in Tables IV and V, and

15 Table VII shows for a simulated race using actual totalizator data, a comparison between the preferred embodiment of the present invention and a prior art system.

As seen in Fig. 1, the computer system operated by the TAB Limited consists of a central computer C which is linked by land lines, telephone lines or like communication links L to betting terminals T which can be located at either widely geographically dispersed betting shops S or at a race track R.

20 In the described example it is assumed that the total amount punted or invested by punters on a win pool will be in the vicinity of \$500,000. As punters can make investments either on the win totalizator, or on fixed odds betting, or both, the term "wager" will be used in respect of monies invested in the win totalizator and the term "bet" will be used in respect of monies invested in the fixed odds betting (FOB).

25 The first step in the operation of the system is to open a substantially conventional win totalizator system. Preferably, this takes place many hours before the commencement of a particular race and, during an initial period following the commencement of the tote, no fixed odds bets are accepted. During this period, the monies wagered by punters can be used to form an actual market guide which is then
30 used to frame the fixed odds to be offered. This situation of accepting only tote wagers, and not accepting fixed odds bets is continued until a predetermined target is reached. In the described preferred embodiment this predetermined target is a tote investment pool of \$100,000 representing 20% of the estimated final pool. It is not essential that this be the way of determining the predetermined target. In other
35 embodiments the predetermined target can be either a monetary target and/or a time target (i.e. that the initial "tote investments only" period had been in operation for a sufficient length of time).

To continue with the preferred embodiment, once the initial tote investment of \$100,000 has been reached (being 20% of the expected total overall investment) the

position reached is as indicated in Tables I and II. In Table I the initial tote investment of \$100,00 is indicated. From this is deducted the commission (14.25%) representing \$14,250 which is used to fund the totalizator agency. This leaves an available initial tote pool of \$85,750.

5 In Table II, the first column indicates the number allocated to each of the eight runners in the race. The second column indicates the distribution of the initial tote investment amongst the various runners. This investment will be an indication from the punting public of their view of the likely chances of success of various runners. That is to say, Runner 1 has the most money wagered on its behalf and therefore should expect
10 to be the "favourite" while Runner 7 has the least money wagered on its behalf and should therefore be the "outsider".

If the \$85,750 pool is divided by the investment for each runner then an approximate tote dividend per \$1 investment can be calculated. This is indicated in the third column of Table II so that $\$85,750/\$25,000$ equals 3.43; $\$85,750/\$5,000$ equals
15 17.15, and so on.

The numbers in the third column of Table II are now rounded downwardly to the nearest integral number of ten cents so that 3.43 for Runner 1 becomes 3.40. This figure is then declared to be two things. Firstly, at this stage in the operation of the tote, the figure is the estimated tote dividend for each of the runners based upon the
20 monies wagered to date.

In addition, in accordance with the preferred embodiment, the numbers in the fourth column of Table II also constitute the opening fixed odds betting dividend and therefore determine the pay out or dividend to be made on the basis of fixed odds betting which commences at the completion of the calculation which gives rise to Table
25 II.

In this connection it should be understood that for Runner 1, for example, the odds are actually 2.4 to 1 since the dividend of \$3.40 indicates both the return of the initial bet and the money paid in accordance with the odds.

Once the position as outlined in Table II has been reached, the central
30 computer C in Fig. 1 sends a signal to each of the terminals T which overcomes the previously disabling signal which prevented the terminals T from accepting fixed odds bets. That is, the terminals T are enabled. From now on, the FOB dividends are displayed and the terminals T are able to accept fixed odds bets. This situation is allowed to continue until a calculatable target has been reached which, in the preferred
35 embodiment, is the investment by punters of a further \$20,000 into the total system.

This gives rise to the situation as indicated in Table III where, for the purposes of this embodiment, it is assumed that in addition to the initial tote investment a further \$10,000 has been wagered on the tote and \$10,000 has been bet on the FOB. This gives rise to a total pool of \$120,000. From this investment is deducted the 14.25%

commission (i.e. \$17,100) which gives an updated total pool available for distribution of \$102,900.

At this stage in order to limit the liability of the operator of the system, the FOB dividend (or odds) should be revised. This revision is explained in relation to Table IV.

The first two columns of Table IV reproduce the first two columns of Table II. The third column of Table IV shows the breakdown of the further tote investment of \$10,000 amongst the eight runners. The fourth column of Table IV reproduces the fourth column of Table II.

The fifth column of Table IV illustrates the breakdown amongst the various runners of the FOB investment which totals \$10,000. It will be seen, in particular, that the same amount has been bet on both runners 6 and 7, notwithstanding that the initial FOB dividend for these two runners is markedly different.

The sixth column in Table IV illustrates the FOB liability in the event that the winner of the race should be each of the various runners. Thus since \$3,000 has been bet on Runner 1 winning the race at an initial FOB dividend of \$3.40, the liability in the event that Runner 1 wins is $\$3.40 \times 3000 = \$10,200$. Similarly, the liability in the event that Runner 2 should win is $\$17.10 \times 1000 = \$17,100$.

Column 7 in Table IV illustrates the total tote investment which is simply the total of columns two and three in Table IV.

The eighth column in Table IV is the revised FOB dividend and the calculation of the entries in this column will be explained in relation to Table V.

The calculation explained in Table V is carried out for each of the eight runners of Table IV, however, it is illustrated in detail only for Runner 7. As indicated from Table II, the updated total pool at the time of this revision of the FOB dividend is \$102,900. In the event that Runner 7 should win, then from column six of Table IV the liability for the winning FOB bets is \$28,500. The pay out of this amount would leave available for distribution to those persons who had wagered on the tote, an amount of \$74,400. From column seven of Table IV the total number of winning tote units for Runner 7 is 4000. As a consequence, the estimated tote dividend in the event that Runner 7 should win is $\$74,400/4,000 = \18.60 .

If the calculation outlined in Table V for Runner 7 is carried out for each of the other runners indicated in Table IV, then the numbers indicated in column eight of Table IV are able to be calculated. For example, for Runner 5, the updated total pool is \$102,900 from which is subtracted the FOB liability (\$7,100) in the event that Runner 5 wins, which gives a total of \$95,800 available for distribution to the tote winners. Since the total tote investment is \$13,000 or 13,000 units, the resulting calculation is $\$95,800/13,000 = \7.37 and thus the FOB dividend for Runner 5 is

increased from \$7.10 to \$7.30 (\$7.37 again in this embodiment being rounded down to the nearest integral number of ten cents).

This estimated tote dividend is now adopted as the revised FOB dividend in order to bring about two results. The first result is to reflect the fact that the monies
5 bet on FOB as indicated in column five of Table IV are not in the same proportion as the total tote investment wagered as indicated in column seven. This imbalance requires a change in the odds. Furthermore, the odds must be changed in such a way as to ensure that, irrespective of the outcome, the totalizator operating authority does not make a loss. The above described arrangement ensures that this desirable situation
10 is retained.

The above described revision of the FOB dividend is preferably carried out in a series of cycles during the course of the punting leading up to starting time. Naturally, in calculating this revision it is necessary to calculate the total FOB liability on each runner to date. Thus it is necessary to know the total value of bets on each
15 FOB dividend "offered" at the end of each revision cycle.

A revision cycle can be triggered by any one, or if desired, any one or more of, a number of factors. Preferably, these factors can include the total amount invested by punters, the total liability of the FOB betting, the value of FOB bets, the number of FOB bets, the time since FOB betting commenced or changes in excess of a
20 predetermined magnitude between the estimated return as a result of totalizator wagers as compared to the guaranteed return for FOB betting (that is if the FOB odds and the totalizator "odds" become different by more than a predetermined amount).

As a consequence of the above, during the course of the betting the FOB dividend changes over time in approximately the same way that the estimated return
25 from totalizator wagering also changes over time. This amounts to "normal betting fluctuations" which occur as a matter of routine in the lead up to a race.

In order to protect the totalizator and fixed odds betting authority from loss, it is desirable to limit the maximum amount which can be bet by any one punter. This also has the advantage of ensuring that if a number of punters wish to bet at the same
30 time, then a number of punters are able to at least place some money on their fancied runner at the desired odds. One way of limiting the size of the maximum available bet is indicated in Table VI and utilises the principle that the maximum available bet should constitute some specified fraction, for example one half, of the maximum amount of money then available at the time the bet is placed.

35 Table VI is understood to be a calculation carried out at the same time as the calculation in Table V is carried out. Thus, for this example, the calculation is carried out at the time the updated total pool available is \$102,900. Again the calculation is carried out for Runner 7, in which case the FOB liability of \$28,500 is subtracted to give a maximum pay out available of \$74,400. This amount of money is the amount

which could be paid to a single person betting a large sum of money without incurring any loss by the totalizator operating authority.

If, as a matter of prudence, half of that maximum pay out is deemed to be the factor which governs the maximum bet, then the pay out made to the maximum bet would be $\$74,400/2 = \$37,200$.

Since at this time the FOB dividend currently on offer for Runner 7 is \$18.60, if the maximum pay out is divided by this dividend this indicates a bet of \$2000 can be accepted at a dividend of 18.60 in order to limit the maximum pay out to \$37,200.

If this bet should be placed, the pool is slightly increased, however, the FOB liability has been substantially increased, and thus application of the same rule indicates that the next maximum bet allowable would be in the vicinity of half that previously acceptable, i.e. approximately \$1,000. This procedure can be applied repeatedly in order to both limit the liability of the totalizator operating authority and also to make it less likely that a particular punter can place all the available bets on a particular runner at a particular offered odds.

The above described procedures are continued in the lead up to the race, however, in accordance with the preferred embodiment, a disabling signal is sent by the central computer C to each of the terminals T in Fig. 1 at a predetermined time (eg. 1 minute) before advertised race starting time. This therefore closes off the fixed odds betting. However, tote wagering is permitted to continue up and until jump time or actual start time. This allows arbitrage punters time to invest so that the dividend on totalizator wagering becomes very close to the bookmaker's Starting Prices as is presently the case. This has the practical result of making the totalizator pool the "last" fixed odds bet practically available on every runner and thus the totalizator FOB dividend effectively equates to the "Starting Price dividend" for each selection.

In some jurisdictions there may be concern that traditional totalizator wagers investors would subsidise those bettors who take advantage of 'overs' from Fixed Odds. Essentially this concern arises because those wagering into the totalizator might pay 'more tax' than those who opted to take advantage of fixed odds.

In effect this possibility is a price that has to be borne in order to introduce Fixed Odds whilst still guaranteeing a set rate of commission to the operating authority. In order to minimise this tax anomaly an enhancement to the above described embodiment has been developed.

The enhancement involves rounding down the price which is offered to bettors before displaying the Fixed Odds price. The following roundings' scale across the range of dividends has now been introduced into the model:

CALCULATED FOB PRICE	FOB PRICE ROUNDED DOWN TO:	EXAMPLE
1.00 - 2.99	lower 0.10¢	2.16 rounded down to 2.10
3.00 - 4.99	lower 0.20¢	3.34 rounded down to 3.20
5.00 - 9.99	lower 0.50¢	5.47 rounded down to 5.00
10.00 - 19.99	lower \$1.00	12.75 rounded down to 12.00
20.00 - 49.99	lower \$5.00	27.43 rounded down to 25.00
50.00 - 99.99	lower \$10.00	74.89 rounded down to 70.00
100.00 and above	lower \$50.00	154.36 rounded down to 150.00

Essentially the enhancement provides the following:

- Fixed Odds bettors pay a greater rounding premium on their bets in comparison to those making totalizator wagers.
- The greater rounding premium imposed on Fixed Odds bettors reduces any 'subsidising' effect of those making totalizator wagers. This is because some may argue that in the event of the fixed odds dividend falling in the course of operation of the pool, those fixed odds bettors who placed their bet at a high fixed odd dividend relative to the final totalizator dividend are being subsidized to some extent by all those making totalizator wagers. In effect, the rounding down of Fixed Odds dividend is to the benefit of the totalizator pool.
- The rounded down Fixed Odd dividends are easily accepted by bettors as they are similar to those rounded down odds offered by traditional bookmakers.
- The need to refresh dividends (i.e. re-calculated the fixed odds and tote dividends is less frequent).

In another embodiment of the present invention, it is desirable to prevent the fixed odds offered from jumping quickly back and forth between two levels each time the fixed odds are recalculated. This may be termed "hunting" and is experienced in engineering systems where the quantity controlled, say the speed of a motor, varies continually from just above to just below, the desired motor speed.

In this embodiment, the fixed odds are notionally recalculated with each bet but the odds are "clamped" to the current odds unless a specific threshold is exceeded. This can be explained as follows:

Firstly, there is a set of possible dividends, which although numerous is, in practise, limited in number as follows:

\$1.20 to \$3.80 in increments of \$0.20,
\$4.00 to \$9.00 in increments of \$0.50,

\$10.00 to \$18.00 in increments of \$2.00,
\$20.00 to \$45.00 in increments of \$5.00,
\$50.00 to \$90.00 in increments of \$10.00,
\$100.00 to \$250.00 in increments of \$50.00.

5 Secondly, the concept of a "raw dividend" as opposed to an offered, and displayed, dividend can be introduced as follows:

Initial Fixed Odds Market Calculation Prior to Accepting Fixed Odds Betting

10 The total amount of investment in the totalizator pool is reduced by a commission to form a dividend pool.

Dividend Pool = Total investment multiplied by (1-Commission rate)

eg Total investment = \$100,000

Commission rate = 14.25%

Dividend Pool = \$100,000 x (1-0.1425) = \$85,750

15 For each runner

Initial Raw Dividend = Dividend Pool divided by Totalizator Investment on the runner

eg For a Dividend Pool of \$85,750 and a Totalizator investment on a particular runner of \$34,200,

20 the Raw Dividend = $\$85,750 \div 34,200 = \2.50731

The Dividend Offered must come from the set of possible dividends referred to above and will be highest possible dividend which is less than or equal to the Raw Dividend.

25 eg if the Raw Dividend is \$2.50731 then the Dividend Offered is \$2.40. This is because the possible offered dividends were \$2.20, \$2.40, \$2.60 etc and \$2.40 was the highest which was less than or equal to the raw dividend.

Subsequent Fixed Odds Market Calculations

30 Any investment (whether fixed odds bet or totalizator wager) into a pool can change the dividend offered on one or more runners so a recalculation of the raw dividend is performed after each investment.

Thus, after fixed odds betting commences, for each runner:

Raw Dividend = (Dividend Pool less Fixed Odds Liability on the runner) divided by Totalizator Investment on the runner

35 eg Assume \$2,500 Fixed Odds bet on a runner (say Number 1) paying \$2.40 is taken, then

The Dividend Pool is $(102,500) \times (1-0.1425) = \$87,893.75$,

The Fixed Odds Liability is \$6,000, and

The Totalizator Investment on Runner No 1 is \$34,200

Then the Raw Dividend is $\frac{(87893.75 - 6000)}{34200} = \2.39455 which is less than \$2.40.

So the New Dividend Offered for Runner No 1 without any clamping is \$2.20.

5 Assume that this calculation is followed by a next bet of \$250 on a different runner.

The recalculation for Runner No 1 is:

The Dividend Pool is $(102,750) \times (1 - 0.1425) = \$88,108.125$

The Fixed Odds Liability = \$6,000, and

10 The Totalizator Investment on Runner No 1 = \$34,200.

Thus the Raw Dividend is $\frac{(88108.125 - 6000)}{34200} = \2.40082 which is more than \$2.40.

So the New Dividend Offered for Runner No 1 without any clamping is now \$2.40.

15 It can be seen that after taking two fixed odds bets the dividend offered without any clamping for the runner has "hunted" by changing from \$2.40 originally, to \$2.20, and then changing back to \$2.40. This is an undesirable occurrence. Consequently a method to "clamp" the dividend at its current offered figure and prevent small fluctuations has been devised.

20

Basic Clamping

After the initial Fixed Odds Market is calculated there is an upper and lower band calculated for each runner.

25 The Lower Bound of Current Dividend Offered is one quarter of the magnitude from Current Dividend Offered to Next Lowest Dividend able to be offered. The Upper bound of Current Dividend Offered is one quarter the magnitude from Next Highest Dividend able to be offered to Second Next Highest Dividend able to be offered.

30 For example, as the possible dividends are, say \$2.00, \$2.20, \$2.40, \$2.60, etc, if the Current Dividend offered is \$2.20 then the Lower Bound of the Current Dividend Offered is \$2.20 minus one quarter of \$2.20 - \$2.00,

$$\text{or } \$2.20 - \$0.20 \div 4 = \$2.20 - \$0.05 = \$2.15.$$

Similarly the Upper Bound of the Current Dividend Offered is \$2.20 plus one quarter of \$2.60 - \$2.40,

35 $\text{or } \$2.20 \text{ plus } \$0.20 \div 4 = \$2.20 + \$0.05 = \$2.25$

This effectively provides a "smearing" which if the dividends are equally spaced is an equally spaced band it either side of the Current Dividend Offered.

However, all the possible dividends are not equally spaced since there are jumps in the spacing between dividends. For example the dividends around \$4.00 progress as follows: \$3.60, \$3.80, \$4.00, \$4.50, \$5.00, \$5.50, etc.

Thus if the Current Dividend Offered is \$4.00 then the Lower bound of the Current Dividend is \$4.00 minus one quarter of $(\$4.00 - \$3.80) = \$3.95$. Similarly the Upper Bound of the Current Dividend is \$4.00 plus one quarter of $(\$5.00 - \$4.50) = \$4.125$.

For the Current Dividend Offered to remain the same, the new Raw Dividend calculated after each wager or bet must lie between the Lower Bound of Current Dividend Offered and the Upper Bound of Current Dividend Offered. If the Current Dividend Offered is to change then the Dividend Offered will be the highest possible dividend which is less or equal to the Raw Dividend.

So if the initial calculation of odds gave a raw dividend of \$4.49, which would give an offered dividend of \$4.00, then for each of thirteen successive bets the following recalculations are made:

Recalculation	Raw Dividend	Unclamped Dividend	Current Offering
Initial	4.49	4.00	4.00
1	4.29	4.00	4.00
2	4.11	4.00	4.00
3	3.97	3.80	4.00
4	3.94	3.80	3.80
5	3.98	3.80	3.80
6	4.01	4.00	3.80
7	3.98	3.80	3.80
8	4.03	4.00	3.80
9	3.94	3.80	3.80
10	3.99	3.80	3.80
11	4.05	4.00	3.80
12	4.12	4.00	3.80
13	4.19	4.00	4.00

It will be seen that the effect of "clamping" is to firstly remove small fluctuations in the fixed odds being offered, and secondly to slow the trend towards a

change in fixed odds offered. Both of these effects make the overall system more stable. Also, since the time between adjacent bets may be very small, the slower response makes the change in odds more comprehensible for punters.

5 **Confirmation of Fixed Odds Bets**

It is not necessary in accordance with the present invention for fixed odds bets to be confirmed. One way of accepting fixed odds bets is for the customer to indicate the minimum dividend which is acceptable to him. Thus if the displayed dividend happens to drop just before, or just as, the punter's bet is being processed, and the new
10 dividend is below that indicated as being acceptable, then the bet will be rejected by the computer. Clearly if the displayed offered dividend increases just before, or just as, the bet is being processed there is no difficulty.

The other way in which bets can be rejected is if the total bet on a particular runner exceeds the maximum bet allowable for that runner. It is then necessary for the
15 punter to resubmit two or more individual bets by which time the odds and/or maximum bet allowable for that runner could well have changed.

Novelty searches located after the priority date have disclosed Australian Patent No. 590 777 (previously Application No. 60112/86) granted to ATL Pty Limited. This patent discloses a combined totalisator and fixed odds betting system
20 which has not found commercial acceptance and the patent has not been renewed. The basis of this prior art system differs from that of the present invention in a number of important aspects.

Firstly, in the calculation of the tote dividend and the fixed price for each contestant, only a fraction of the tote pool is used. This fraction is said to preferably be
25 50% (i.e. 0.50) and to lie with the range between 1% and 99%. This fraction is termed the "proportion" parameter. There is no equivalent to this parameter in the present invention as the entire tote pool is used in such calculation instead.

Secondly, in order to limit the liabilities arising from receipt of fixed odds wagers, the prior art system uses a "responsiveness factor" which is preferably 4% to
30 exaggerate the liabilities incurred in response to bets made at "high prices". Again there is no equivalent in the present invention.

Thirdly, in the prior art system it is essential to recalculate and re-display the fixed odds prices being offered each time a fixed odds bet is made. This is not the case with the present invention and the substantial computational load imposed by this
35 requirement of the prior art is thereby avoided by the present invention.

Fourthly, in calculating the tote dividend for a particular runner, the prior art system divides by the sum of two amounts - namely the total of the fixed price bets for the runner, and the product of the proportion parameter and the total of the tote wagers

for the runner. This is to be contrasted with the present invention in which the division is by the total of the tote wagers for the runner.

Fifthly, in calculating the "fixed price" (or fixed odds betting dividend), the prior art system utilizes a "maximum allowed fixed price wager" which is another system parameter which is preferably set to 1% of the total of the tote wagers to date. Again, there is no such system parameter in the present invention.

In view of the foregoing, it is clear that there are substantial differences between the prior art system and the present invention. A computer simulation has been carried out by the applicant using actual data from a totalizator pool operated for a Sydney race meeting but using the assumption that after the initial commencement all monies actually received by the pool were to be allocated 50:50 between tote wagers and FOB bets. This simulation was further carried out for the preferred embodiment described in the ATL Pty Limited patent again using the same data and the same assumptions.

The results are shown in Table VII, and set out the total of the combined pool at each of 11 sequential times. The first is 9 minutes before advertised race start time (ARST), the next 8 before ARST, and so on until ARST is reached, and finally the time "CLOSE" being the time shortly before the actual delayed commencement of the race at which time the tote actually closed.

It is clear from Table VII that the "FO" (or fixed odds betting dividend) closely tracks the "TOTE" or totalizator wagering dividend for the present invention (TAB). However, for the prior art system there is a large discrepancy.

In the particular race, for runners no. 2 both the tote and fixed odds dividend for that runner consistently are reduced (i.e. "shorten") as the money is deposited into the pool. The reverse applies for, say, runner no. 7 whose dividends grow as an increasingly smaller proportion of the total monies deposited into the pool wish to wager or bet on runner no. 7.

It will be seen that for the preferred embodiment (TAB) the dividends for runner no. 1 decrease and those for runner no. 7 increase over time towards the close. Further there is always a close similarity between the TOTE dividend and the fixed odds dividend. However, for the prior art system (ATL) there is a markedly lower dividend for fixed odds bets than for totalizator wagers, except for the "lowest priced runners" where this position is actually reversed. Further, the flow of money in favour of the "lowest priced runners" does not in the (ATL) system increase the dividends as should be the case for the other runners, for example for runner no. 7, as much as the increase in the present invention (TAB). Thus in the ATL system horses which are not backed during the course of the pool do not "blow-out" in the betting.

The foregoing describes in detail only some embodiments of the present invention and modifications, obvious to those skilled in the art, can be made thereto without departing from the scope of the present invention.

5 For example, although the preferred embodiment has been described in relation to horse racing, the "runners" need not be horses since the present invention is equally applicable to greyhounds, harness racing and other sporting competitions or events where the running of the competition or event provides a winner and thus the various competitors or participants constitute "runners".

10 Similarly, with dead heats, if there are two first equal then the fixed odds payout for each runner is one half the payout which would be made had that runner run alone. Similarly, if there are three runners involved in a dead heat, the payout for each is one third of the payout which would have been made had the respective runner won alone. For the tote payouts, the situation as regards dead heats and places is governed by the existing rules.

15

TABLE I

	\$
Initial Tote Investment	100,000
Less 14.25% Commission	14,250
Available Initial Tote Pool	85,750

TABLE II

(1) Runner	(2) Initial Tote Investment	(3) Approximate Tote Dividend per \$1.00 Investment	(4) Down Rounded Tote Dividend and FOB Dividend
1	25,000	3.43	3.40
2	5,000	17.15	17.10
3	18,000	4.76	4.70
4	9,000	9.53	9.50
5	12,000	7.15	7.10
6	20,000	4.29	4.20
7	3,000	28.58	28.50
8	<u>8,000</u>	<u>10.72</u>	<u>10.70</u>
	100,000	85.61	85.20
	(85,750 Pool)		

First Update Total Investment

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TABLE IV

(1) Runner	(2) Initial Tote Investment	(3) Further Tote Investment	(4) Initial FOB Dividend	(5) FOB Investment	(6) FOB Liability	(7) Total Tote Investment	(8) Revised FOB Dividend
1	25,000	2,000	3.40	3,000	10,200	27,000	3.40
2	5,000	2,000	17.10	1,000	17,100	7,000	12.20
3	18,000	1,000	4.70	1,000	4,700	19,000	5.10
4	9,000	1,000	9.50	1,000	9,500	10,000	9.30
5	12,000	1,000	7.10	1,000	7,100	13,000	7.30
6	20,000	1,000	4.20	1,000	4,200	21,000	4.70
7	3,000	1,000	28.50	1,000	28,500	4,000	18.60
8	<u>8,000</u>	<u>1,000</u>	10.70	<u>1,000</u>	10,700	<u>9,000</u>	10.20
	100,000	10,000		10,000		110,000	
	(85,750)						

TABLE V

Runner 7 Initial FOB Dividend Update

	\$
Updated Total Pool	102,900
Less FOB Liability (For Runner 7)	<u>28,500</u>
Runner 7 Tote Pool	<u>74,400</u>
Total Tote Investment (For Runner 7)	4,000
Estimated Tote Dividend $74,400/4,000 = 18.60$	

TABLE VI

Runner 7 Maximum Bet Available Calculation

	\$
Updated Total Pool	102,900
Less FOB Liability (For Runner 7)	<u>28,500</u>
Maximum Payout	<u>74,400</u>
50% of Maximum Payout	37,200
Divide by FOB Dividend $18.60 = 37,200/18.60 = 2,000$	
Maximum Bet Able to be Accepted = \$2,000	

01 10 00 0000

TABLE VII

		POOL = \$54,228.0 TIME = 9 MINS.				POOL = \$58,207.0 TIME = 8 MINS.				POOL = \$62,400.0 TIME = 7 MINS.			
		TAB		ATL		TAB		ATL		TAB		ATL	
Runner No.		TOTE	FO	TOTE	FO	TOTE	FO	TOTE	FO	TOTE	FO	TOTE	FO
1		3.2	3.2	3.2	3.1	3.3	3.3	3.2	3.0	3.3	3.3	3.1	3.0
2		4.4	4.4	4.4	4.0	4.1	4.2	3.5	3.9	3.8	3.8	2.7	3.7
3		18.4	18.4	18.4	13.1	18.8	18.4	17.8	12.9	19.1	19.0	18.5	12.8
4		5.1	5.1	5.1	4.7	5.3	5.3	5.2	4.7	5.5	5.5	5.4	4.8
5		11.4	11.4	11.4	9.2	11.9	11.8	11.5	9.2	12.3	12.2	12.2	9.3
6		24.0	24.0	24.0	15.7	24.3	24.0	24.6	15.3	24.6	24.8	25.2	15.2
7		14.4	14.4	14.4	11.0	14.5	14.4	13.9	10.7	14.9	14.9	14.6	10.7
8		9.6	9.6	9.6	8.0	9.4	9.6	8.2	7.7	9.5	9.3	7.9	7.7
9		16.0	16.0	16.0	11.9	15.4	15.4	12.5	11.2	15.8	15.4	12.8	11.2
10		80.7	80.7	80.7	28.5	86.5	85.7	90.0	28.7	86.6	85.5	83.4	27.7
11		82.9	82.8	82.9	28.8	85.6	85.3	88.4	28.6	86.5	84.2	88.1	28.1

TABLE VII cont

		POOL = \$135,769.0 TIME = ARST			POOL = \$147,436.5 TIME = CLOSE		
		TAB		ATL	TAB		ATL
Runner No.		TOTE	FO	TOTE	FO	TOTE	FO
1		3.4	3.4	2.6	2.9	3.5	3.4
2		3.4	3.4	2.0	3.1	3.2	3.2
3		16.0	15.8	13.2	10.2	16.0	15.8
4		5.1	5.0	3.6	4.3	5.2	5.2
5		15.7	15.6	13.1	10.1	15.9	15.6
6		23.2	23.0	15.9	12.9	22.8	23.0
7		21.5	21.2	18.5	12.5	22.3	21.9
8		9.3	9.4	7.6	6.8	9.2	9.4
9		19.5	19.1	12.9	11.7	20.6	20.3
10		69.2	69.1	62.7	22.5	73.9	73.4
11		131.6	130.2	129.3	29.5	137.4	134.2
						133.8	30.0

The claims defining the invention are as follows:

1. A method of operating a combined win totalizer and fixed odds betting system for punting on the outcome of a contest between a plurality of contestants, said method comprising the steps of:

- 5 1. operating a tote wager pool comprising a substantially conventional totalizer,
2. operating a bet dividend pool accepting fixed odds bets on each contestant,
3. sequentially opening and closing a succession of periods of time in each of which a plurality of fixed odds bets are accepted and during each of which the odds offered for each contestant remain fixed, and
- 10 4. prior to the opening of each said period of time utilising the liabilities for each contestant arising both from wagers to date placed into the tote wager pool and bets to date made into said bet dividend pool to calculate the fixed odds to be offered for each contestant during the immediately following period of time.

2. The method as claimed in claim 1 wherein the fixed odds dividend for a contestant is calculated by adding the value of said tote wager pool and said bet dividend pool, subtracting from this sum the fixed odds liability for that contestant comprising the product of the value of bets placed for that contestant and the fixed odds dividend for each bet; and dividing the result by the amount wagered in said tote wager pool on that contestant.

3. The method as claimed in claim 1 or 2 wherein the value of said tote wager pool and said bet dividend pool used in step 4 is a net value reduced to allow for commission, taxation, running expenses and like overheads.

25 4. The method as claimed in any of claims 1-3 wherein each said period of time is closed when a predetermined calculable target is achieved.

5. The method as claimed in claim 4 wherein said predetermined calculable target is selected from the group of calculable targets consisting of:

- 30 (a) the value of said bet dividend pool reaching a predetermined percentage of an estimated final pool,
- (b) the total amount invested in said tote wager pool and said bet dividend pool reaching a predetermined value,
- (c) the value of said bet dividend pool reaching a predetermined value,
- 35 (d) a predetermined period of time,
- (e) a predetermined fixed odds betting liability,
- (f) a predetermined value of fixed odds bets,
- (g) a predetermined number of fixed odds bets, and

(h) a predetermined difference between the projected totalizer dividend for any contestant and the calculated fixed odds dividend for that contestant.

6. The method as claimed in any of claims 1-5 wherein a last one of said period of times for accepting fixed odds bets closes prior to the cessation of operation of said tote wager pool so that fixed odds betting ceases prior to the cessation of totalizer wagering.

7. The method as claimed in claim 6 wherein said last one of said period of times closes a predetermined period of time prior to the commencement of said contest.

8. The method as claimed in any of claims 1-7 including the further step of:

recalculating the fixed odds betting dividend for each contestant by rounding down to below the revised estimated totalizer dividend for that contestant.

9. The method as claimed in claim 8 wherein said rounding down is to an integral multiple of a predetermined decimal number.

10. The method as claimed in claim 9 wherein said predetermined decimal number is varied in response to the value of said fixed odds betting dividend.

11. The method as claimed in any one of claims 8-10 wherein the offered fixed odds dividend is maintained at the rounded down dividend provided the recalculated dividend lies within a clamping range of said rounded down dividend.

12. The method as claimed in claim 11 wherein said rounded dividends are spaced apart by integral multiples of a predetermined magnitude, and said clamping range comprises at its lower bound the current rounded dividend less one quarter of the difference between the current rounded dividend and the next lowest rounded dividend, and at its upper bound the current rounded dividend plus one quarter of the difference between the second next highest rounded dividend and the next highest rounded dividend.

13. The method as claimed in any of claims 1-12 including the further step of limiting the amount of money accepted for a fixed odds bet to a predetermined maximum value.

14. The method as claimed in claim 13 wherein for each contestant the maximum fixed odds bet is calculated to be a predetermined portion of the difference between the total of said pools to date less the current fixed odds betting liability to date for the contestant, divided by the current fixed odds betting dividend for that contestant.

15. The method as claimed in claim 14 wherein said predetermined portion is 50%.

16. The method as claimed in any of claims 13-15 including the further step of carrying out the calculation of said maximum fixed odds bet at the commencement of each said period of time.

17. The method as claimed in any of claims 1-16 wherein said contest is selected from the group of contests consisting of horse races, trotting races, greyhound races and human races

18 A combined win totalizer and fixed odds betting system for punting on the outcome of a contest between a plurality of contestants, said system comprising:

1. a plurality of betting terminals each linked to a central processor means and each able to input either a tote wager or a fixed odds bet;
2. a tote wager pool into which said tote wagers are allocated and comprising a substantially conventional totalizer, and
3. a bet dividend pool into which said fixed odds bets on each contestant are allocated, wherein

said central processor means is arranged to sequentially open and close a succession of periods of time in each of which a plurality of fixed odds bets are accepted and during each of which the odds offered for each contestant remain fixed, and

said central processor means prior to the opening of each said period of time, utilises the liabilities for each contestant arising both from wagers to date placed into the tote wager pool and bets to date made into said bet dividend pool to calculate the fixed odds to be offered for each contestant during the immediately following period of time.

19. The system as claimed in claim 18 wherein said central processor means calculates the fixed odds dividend for a contestant by adding the value of said tote wager pool and said bet dividend pool, subtracting from this sum the fixed odds liability for that contestant comprising the product of the value of bets placed for that contestant and the fixed odds dividend for each bet; and dividing the result by the amount wagered in said tote wager pool on that contestant.

20. The system as claimed in claim 18 or 19 wherein said central processor means reduces the value of said tote wager pool and said bet dividend pool to a net value by allowing for commission, taxation, running expenses and like overheads.

21. The system as claimed in any of claims 18-20 wherein said central processor means closes each said period of time when a predetermined calculable target is achieved.

22. The system as claimed in claim 21 wherein said predetermined calculable target is selected from the group of calculable targets consisting of:

- (a) the value of said bet dividend pool reaching a predetermined percentage of an estimated final pool,
- (b) the total amount invested in said tote wager pool and said bet dividend pool reaching a predetermined value,

(c) the value of said bet dividend pool reaching a predetermined value,

(d) a predetermined period of time,

(e) a predetermined fixed odds betting liability,

5 (f) a predetermined value of fixed odds bets,

(g) a predetermined number of fixed odds bets, and

(h) a predetermined difference between the projected totalizer dividend for any contestant and the calculated fixed odds dividend for that contestant.

23. The system as claimed in any of claims 18-22 wherein said central processor closes a last one of said period of times for accepting fixed odds bets prior to the cessation of operation of said tote wager pool so that fixed odds betting ceases prior to the cessation of totalizer wagering.

24. The system as claimed in claim 23 wherein said central processor means closes said last one of said period of times a predetermined period of time prior to the commencement of said contest.

25. The system as claimed in any of claims 18-24 wherein said central processor means

recalculates the fixed odds betting dividend for each contestant by rounding down to below the revised estimated totalizer dividend for that contestant.

20 26. The system as claimed in claim 25 wherein said central processor means rounding down is to an integral multiple of a predetermined decimal number.

27. The system as claimed in claim 26 wherein said central processor means varies said predetermined decimal number in response to the value of said fixed odds betting dividend.

25 28. The system as claimed in any one of claims 25-27 wherein said central processor maintains the offered fixed odds dividend at the rounded down dividend provided the recalculated dividend lies within a clamping range of said rounded down dividend.

29. The system as claimed in claim 28 wherein said rounded dividends are spaced apart by integral multiples of a predetermined magnitude, and said clamping range comprises at its lower bound the current rounded dividend less one quarter of the difference between the current rounded dividend and the next lowest rounded dividend, and at its upper bound the current rounded dividend plus one quarter of the difference between the second next highest rounded dividend and the next highest rounded dividend.

30. The system as claimed in any of claims 18-29 wherein said central processor means limits the amount of money accepted for a fixed odds bet to a predetermined maximum value.

31. The system as claimed in claim 30 wherein said central processor means calculates for each contestant the maximum fixed odds bet to be a predetermined portion of the difference between the total of said pools to date less the current fixed odds betting liability to date for the contestant, divided by the current fixed odds betting dividend for that contestant.

32. The system as claimed in claim 31 wherein said central processor means utilizes 50% as said predetermined portion.

33. The system as claimed in any of claims 30-32 wherein said central processor means carries out the calculation of said maximum fixed odds bet at the commencement of each said period of time.

34. The system as claimed in any of claims 18-33 wherein said contest is selected from the group of contests consisting of horse races, trotting races, greyhound races and human races.

Dated 1 October, 1998

TAB Limited

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SPRUSON & FERGUSON

